#### September - October • 1932

# The CRUSHED STONE JOURNAL

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Stone Screenings As a Blanket Layer Under Macadam

"More or Less" Contracts May Prove Costly

Methods of Reclaiming Old Macadam Roads

> Quarry Section Holds Annual Meeting





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New Castle Lime & Stone Company	
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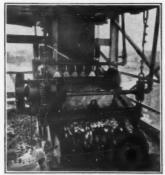
J. A. Bourbonnaie	Vaudreuil, Que.
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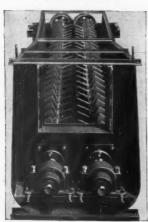
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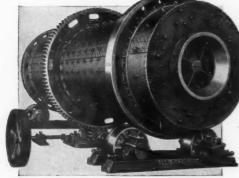
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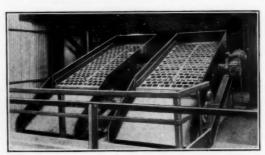
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## The Crushed Stone Journal

Official Publication of the NATIONAL CRUSHED STONE ASSOCIATION

J. R. BOYD, Editor

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## THE

## CRUSHED STONE JOURNAL

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## Accident-Prevention Contest Among Crushed Stone Quarries in 1931'

By W. W. ADAMS<sup>2</sup>

SINCE 1926 the United States Bureau of Mines, in cooperation with the National Crushed Stone Association, has been conducting annual safety contests among crushed stone producers that are members of that association. The results of the sixth annual contest covering the calendar year 1931 are presented herewith. A safety trophy, The Explosives Engineer Award, is presented by the National Crushed Stone Association to the company that makes the best accident-prevention record.

Progress in safety has been so far advanced at crushed stone operations that each year's safety competition reveals one or more plants that have had no lost-time accidents during the contest year. In such cases the trophy is awarded to the plant whose record shows the largest number of man-hours of work performed. Fifty-eight open quarries and three underground limestone mines participated in the contest of 1931; fifteen open quarries and one underground mine were operated without a lost-time accident.

The association's safety contest is participated in by company members of the National Crushed Stone Association that are enrolled in the National Safety Competition, the latter being a safety contest conducted annually by the Bureau of Mines among several hundred of the larger mines and quarries throughout the United States. Three hundred and fifty mines and quarries were enrolled in the National Safety Competition of 1931; as previously indicated, 61 of these plants were operated by companies that hold membership in the National Crushed Stone Association.

To select the best accident-prevention record among the various competing companies, all plants are graded ♦ North American Cement Corporation's limestone quarry at Martinsburg, W. Va., wins contest. Fifteen other plants make perfect records.

according to their accident-severity rates. These rates represent the number of days of disability of injured employees for each 1,000 man-hours of work done by all employees at the plant.

#### Scope of Contest

The general scope of the safety contest of 1931 is indicated by the number of plants participating, their geographic distribution, and the number of man-hours of work performed. Seventeen States were represented by the 61 participating plants; these States are Massachusetts, Connecticut, New York, Pennsylvania, Maryland, Georgia, West Virginia, Ohio, Kentucky, Tennessee, Indiana, Illinois, Minnesota, Missouri, Oklahoma, Texas, and California. The operations of the plants in the production of crushed stone represented the equivalent of 5.085,857 man-hours of work at open quarries and 345,105 man-hours at underground mines. Accidents at these plants included 4 fatalities and 215 nonfatal injuries; the time-charge for measuring the length of disability of the employees injured or killed was 46,347 days, including a charge of 24,000 days for the 4 fatal accidents.

#### Accident Rates

The contest revealed an accident-frequency rate per million man-hours of exposure of 42 for open quarries and 12 for underground mines, and an accident-severity rate per thousand man-hours of exposure of 9 for open quarries and 0.4 for underground mines.

In view of the small number of underground mines represented, the accident rate based upon their ex-

<sup>&</sup>lt;sup>1</sup> Published by permission of the Director, U. S. Bureau of Mines. (Not subject to copyright.)

<sup>2</sup> Chief Statistician, Demographical Division, U. S. Bureau of Mines.

TABLE 1.—YEARLY SUMMARY—NATIONAL CRUSHED STONE ASSOCIATION SAFETY CONTEST, 1925-1931, INCLUSIVE 1

			Hours		Num	ber of Ac	cidents			Number of days lost					Frequency	Severity
	Year	Plants	Worked	Fatal	P.T.	P.P.	Temp.	Tota	al	Fatal	P.T.	P.P.	Temp.	Total	Rate	Rate
	1925	38	4,927,402	4		3	292	299	Quarries	24,000		3600	5286	32886	60.681	6.674
	1926	40	5,298,983	3		6	207	216		18,000	****	9000	4239	31239	40.763	5.895
	1927	48	7,876,791	9		2	458	469		54,000		2100	7186	63286	59.542	8.034
	1928	53	7,509,098	8	-	4	322	334		48,000		8700	5493	62193	44.479	8.282
	1929	53	7,970,325	4		5	286	295		24,000		5760	5533	35293	37.012	4.428
	1930	68	8,013,415	6		9	227	242		36,000		7250	3671	46921	30.199	5.855
	1931	58	5,085,857	4		13	198	215		24,000		18660	3540	46200	42.274	9.084
Total	7 Yrs.		46,681,871	38	0	42	1990	2070		228,000	0	55070	34948	318018	44.343	6.812
	1925	3	400,672				29	29	Mines				228	228	72.378	0.569
	1926	3	517,926				34	34					533	533	65.646	1.029
	1927	2	318,449	1		1	14	16		6,000		300	68	6368	50.244	19.997
	1928	5	542,198	1		1	68	70		6,000		300	888	7188	129.105	13.257
	1929	4	665,520	1		1	30	32		6,000		300	617	6917	48.083	10.393
	1930	6	595,367	1		1	15	17		6,000		225	468	6693	28.554	11.242
	1931	8	345,105				4	4		alle silp sile sea			147	147	11.591	.426
Total	7 Yrs.		3,385,232	4	0	4	194	202		24,000	0	1125	2949	28,074	59.671	8.293

As the accident reports from mining companies are considered confidential by the Bureau of Mines, the identity of the plants to which this table reis not revealed. Frequency rate indicates the number of fatal, permanent, and other lost-time accidents per million man-hours of exposure; severity rate tes the number of days lost from accidents per thousand man-hours. Note: P.T., permanent total disability; P.P., permanent partial disability; temporary disability.

The National Crushed Stone Association safety contest began in 1926; figures for 1925 for company members are given for comparison.

perience is hardly typical of the hazard connected with that class of work. On the other hand, as the contest included a much larger number of open quarries, it is probable that the accident rate for openquarrying operations is fairly representative.

#### Winner of Trophy in 1931

The best accident-prevention record among the 61 plants that competed for the National Crushed Stone Association safety trophy in 1931 was that of No. 5 and 6 limestone quarry, at Martinsburg, Berkeley County, W. Va. This quarry was operated by the North American Cement Corporation, and its record was 115,403 man-hours of work without a lost-time accident to any employee. As a result of this achievement, the quarry was adjudged the winner of the safety trophy of the National Crushed Stone Association for 1931.

#### Honorable Mention

Ranking next to the trophy winner and occupying second place in the contest of 1931 was The General

Crushed Stone Company's trap-rock quarry at Quakertown, Bucks County, Pa., with a record of 112,819 man-hours of exposure without an accident.

Third place was won by the Union Limestone Co., on the basis of the safety record of that company's limestone quarry at Hillsville, Lawrence County, Pa.; the quarry worked 99,622 man-hours and had no losttime accidents. The following plants operated by member companies of the Association also completed the year 1931 with no lost-time accidents.

Columbia No. 3 limestone mine, Valmeyer, Monroe County, Ill., operated by the Columbia Quarry Co. Worked 97,788 manhours in 1931.

Birdsboro crushed-stone quarry, Birdsboro, Berks County, Pa., operated by The John T. Dyer Quarry Co. Quarry worked 91,209 man-hours in 1931.

Akron limestone quarry, Akron, Erie County, N. Y., operated by the General Crushed Stone Co. Quarry worked 89,764 manhours in 1931.

Rock-Cut limestone quarry, Syracuse, Onondaga County, N. Y., operated by the General Crushed Stone Co. Quarry worked 84,004 man-hours in 1931.

Security limestone quarry, Security, Washington County, Md., operated by the North American Cement Corp. Quarry worked 80.011 man-hours in 1931.



Employees of Nos. 5 and 6 limestone quarry, North American Cement Co., Martinsburg, West Va., winner of N. C. S. A. 1931 Safety Contest

Table 2.—RELATIVE STANDING OF PLANTS IN THE NATIONAL CRUSHED STONE ASSOCIATION SAFETY CONTEST OF 1931 1 (Arranged according to accident-severity rates)

Code	Rank	Hours		Number of Accidents Number of Days Lost									Frequency	Severit
	Group	Worked	Fatal	P.T.	P.P.	Temp.	Tot	al Fatal	P.T.	P.P.	Temp.	Total	Rate	Rate
						OPI	EN O	UARRIE	25					
1	1	115,403					0					0	.000	.000
2	2	112,819					0					0	.000	.000
3	3	99,622					0					0	.000	.000
5 6	4 5	91,209					0					0	.000	.000
7	6	89,764 84,004					0					0	.000	.000
8	7	80,011					o					ő	.000	.000
9	8	78,123					0					0	.000	.000
10	9	67,816					0					0	.000	.000
11 12	10	63,340				-	0					0	.000	.000
13	11 12	57,366 45,045					0					0	.000	.000
14	13	42,078					0					o o	.000	.000
15	14	33,521					0					0	.000	.000
16 ·	15	17,224					0					0	.000	.000
17	16	112,735				1	1				2	2	8.870	.018
18 19	17 18	33,837				3 2	3				6	6	88.660	.177
20	19	53,457 $34,829$				1	2				11 8	11 8	37.413 28.712	.206
21	20	37,345				2	2				10	10	53.555	.268
22	21	162,925				2	2				45	45	12.276	.276
23	22	63,153	*			2	2				18	18	31.669	.285
25	23	128,009				3	3				71	71	23.436	.555
26	24	66,401				4	4				37	37	60.240	.557
27 28	25 26	68,424				4	4				44	44	58.459	.643
29	27	114,826 $76,577$				1 3	1 3				76 51	$\frac{76}{51}$	$8.709 \\ 39.176$	.662 .666
30	28	67,754				6	6				52	52	88.556	.767
31	29	71,325				5	5				58	58	70.102	.813
32	30	38,433				6	6				33	33	156.116	.859
33	31	118,538				6	6				104	104	50.617	.877
35	32	158,927				1	1			~	164	164	6.292	1.032
36 37	33	47,847				4	4				53	53	83.600	1.108
38	34 35	162,812 $170,236$				1 5	1				186 195	186 195	6.142 29.371	1.142
39	36	37,570				2	5 2				44	44	53.234	1.145 $1.171$
40	37	162,978				7	7				191	191	42.951	1.172
41	38	11,340				1	i				14	14	88.183	1.235
42	39	28,689				3	3				43	43	104.570	1.499
43	40	56,585				5	5				86	86	88.363	1.520
44 45	41	15,960				2	2				28	28	125.313	1.754
46	43	36,772 $120,516$				6 12	6 12				75 261	$\frac{75}{261}$	$163.168 \\ 99.572$	2.040
47	44	46,755				4	4				107	107	85.552	$\frac{2.166}{2.289}$
48	45	112,989				7	7				295	295	61.953	2.611
49	46	112,989				24	24				342	342	212.410	3.027
50	47	88,181			1	2	3			300	17	317	34.021	3.595
51	48	106,175			2	3	5			510	64	574	47.092	5.406
52	49	85,093			1		1			600		600	11.752	7.051
53 54	50 51	47,145 $276,500$	~~~~		1 2	3 20	99	~ = = ~		300	38	338	84.845	7.169
55	52	72,776			3	20	23			2400 750	280 28	$\frac{2680}{778}$	83.183 $41.222$	9.693
56	53	189,734			2	12	14			6900	168	7068	73.788	10.690 $37.252$
57	54	114,446			ī		1			4500		4500	8.738	39.320
58	55	143,448	1			6	7	6000			68	6068	48.798	42.301
59	56	136,992	1			5	6	6000			51	6051	43.798	44.170
60	57	40,450			1	5	6			2400	87	2487	148.331	61.483
61	58	176,039	2			5	7	12000			29	12029	39.764	68.331
otals a		5,085,857	4	0	13	198	215	24,000	0	18,660	3540	46200	42.274	9.084
otals a ates—		8,013,415	6	0	9	227	242	36,000	0	7,250	3671	46921	30.199	5.855
								OUND N						2.000
4	1	97,788							-				0.000	0.000
24	2	161,276				1	1				71	71	6.201	.440
34	3	86,041				3	3				76	76	34.867	.883
otals a		345,105	0	0	0	A	A		0		1.477	1.47		-
otals a	and					4	4	0	0	0	147	147	11.591	.426
ates-	-1930	595,367	1	0	1	15	17	6000	0	225	468	6693	28.554	11.242

<sup>&</sup>lt;sup>1</sup> As the accident reports for mining companies are considered confidential by the Bureau of Mines, the identity of the plants to which this table relates is not revealed. Frequency rate indicates number of fatal, permanent, and other lost-time accidents per million man-hours of exposure; severity rate indicates number of days lost from accidents per thousand man-hours. Note: P.T., permanent total disability; P.P., permanent partial disability; Temp., temporary disability.

Middlefield traprock quarry, Wallingford, New Haven County, Conn., operated by The Connecticut Quarries Co., Inc. Quarry worked 78,123 man-hours in 1931.

Knippa No. 4 traprock quarry, Knippa, Uvaldo County, Texas, operated by the Southwest Stone Co. Quarry worked 67,816 man-hours in 1931.

Gasport dolomite quarry, Gasport, Niagara County, N. Y., operated by the Wickwire Spencer Steel Co. Quarry worked 63,340 man-hours in 1931.

Speed Mill cement quarry, Speed, Clark County, Ind., operated by the Louisville Cement Corp. Quarry worked 57,366 man-hours in 1931.

Hendlers quartzite quarry, Wilkes-Barre, Luzerne County, Pa., operated by the General Crushed Stone Co. Quarry worked 45.045 man-hours in 1931.



C. E. Nisewaner, Supt., winning company, 1931 Safety Contest.

Duluth traprock quarry, Duluth, St. Louis County, Minn., operated by the Duluth Crushed Stone Co. Quarry worked 42,078 man-hours in 1931.

Rocky Hill traprock quarry, Rocky Hill, Hartford County, Conn., operated by The Connecticut Quarries Co., Inc. Quarry worked 33,521 man-hours in 1931.

Mt. Carmel traprock quarry, Mt. Carmel, New Haven County, Conn., operated by The Connecticut Quarries Co., Inc. Quarry worked 17,224 man-hours in

Honorable mention in the safety contest among producers of crushed stone is awarded to all companies

other than the trophy winner whose plants operate without a lost-time accident during the year. Hence 14 open quarries and one underground mine won honorable mention in 1931. Each employee of the company winning the trophy and each employee at each plant that wins honorable mention is given a certificate of honor by the National Crushed Stone Association as a recognition of the employee's contribution to his plant's perfect safety record.

#### Accident-Free Records Since 1926

During 1926, the year of the first annual safety contest among the members of the National Crushed Stone Association, two plants were operated without a lost-time accident; the 1927 contest revealed three plants without an accident; 1928, five plants; 1929, five plants; 1930, seventeen; and 1931, sixteen. In addition to the number of accident-free plants, other plants conducted their operations with records that were almost free of accidents.

#### Winners of Safety Trophies in 1931 And Previous Years

The trophy awarded annually by the National Crushed Stone Association has been won by the following companies:

Year	Louisville Cement Co.,	Name of quarry	Man- hours worked	
	Speed, Clark Co., Ind.	Speed Mill	227,750	0.000
1927	The General Crushed Stone Co., White Haven, Luzerne Co., Pa.	White Haven	159,320	.000
1928	Marquette Cement Mfg. Co., Cape Girardeau, Cape Girardeau, Co., Mo.	Cape Girard-	212,921	.000
1929	Marquette Cement Mfg. Co., Cape Girardeau, Cape Girardeau Co., Mo.	Cape Girard- eau	197,327	.000
1930	Marquette Cement Mfg. Co., Cape Girardeau, Cape Girardeau Co., Mo.	Cape Girard- eau	224,514	.000
1931	North American Cement Corp., Martinsburg, Berkeley County, W. Va.	Nos. 5 and 6	115,403	,000

#### Relative Standing of Plants

Table 2 shows the relative standing of the plants that participated in the safety contest of 1931. While the table does not reveal the identity of the plants, each company has been advised confidentially of the relative standing of its own plants in the contest.

#### Howard Montgomery Rigg

T IS with distinct sorrow that we here record the death on Sunday, September 18, of Howard Montgomery Rigg, Superintendent and member of the Board of Directors of the Acme Limestone Co. of Alderson, W. Va. Mr. Rigg accompanied his brother, J. A. Rigg, to the meeting of our Board of Directors held in Atlantic City during the latter part of July and though our acquaintance with him was brief, we can sympathetically appreciate the severe loss which his death will mean to the Acme Limestone Co. To his immediate family and business associates, we express our heartfelt sympathy in their hour of bereavement.

#### George Steele Earnsham

NNOUNCEMENT of the death of George S. Earnshaw, which occurred on September 17, will be received with sincere sorrow by his many friends and acquaintances throughout the crushed stone industry. Mr. Earnshaw has long been intimately identified with the industry, his father, Ono Earnshaw, having owned and operated a quarry in Lemont, Illinois, and his brother, Fred O. Earnshaw, now being President of the Carbon Limestone Co. of Youngstown, Ohio.

At the time of his death Mr. Earnshaw was a salesman with the Illinois Powder Co.

Our profound sympathy is extended to his family and business associates.

## Stone Screenings As a Blanket Layer Under Macadam

By A. T. GOLDBECK

Director, Bureau of Engineering National Crushed Stone Association

WHEN a layer of crushed stone is laid directly on the subgrade and pressure is applied to it during the rolling operation, naturally the stone will be forced downward as it is being compacted. The usual practice in macadam base construction is to use a layer of coarse stone, generally more or less of one size, although there has been a tendency of late to decrease the minimum of size of stone required. The stone rests on the subgrade at a series of contact points and the stone layer may contain more than fifty per cent of large size communicating voids. When pressure is applied with the roller, these contact points penetrate more or less easily into the subgrade, depending upon its resistance.

If the subgrade material is easily displaced, such as may be the case with clay or fine, fairly clean sand, this displacement will take place upward into

Interesting laboratory experiments demonstrate efficiency of stone screenings as a blanket course under a macadam layer.

the voids in the stone. Clay intermingled with the stone will act as a lubricating agent and will very greatly decrease the supporting value of the stone layer.

If a layer of stone screenings is first placed as a blanket course, and the large size stone is placed on top of this course, this layer of screenings will very effectively prevent the upward intrusion of the subgrade material into the voids in the stone. This is so because when pressure is applied to the layer of stone to compact it, the stone will be pressed downward into the screenings layer and the natural displacement of the subgrade and of the screenings which will occur under this pressure will force and wedge the screenings into the lower surface voids of the stone and the clay will be effectively shut off from upward penetration.

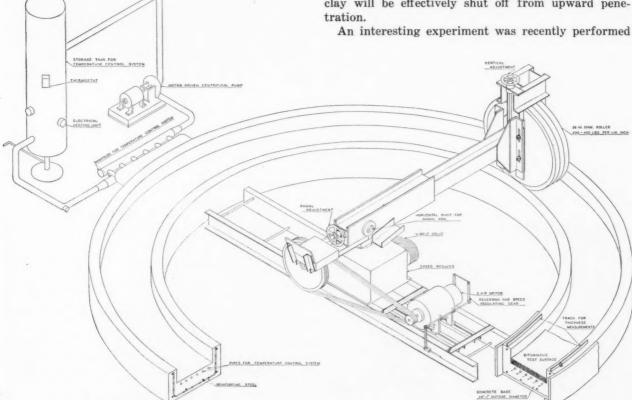


Fig. 1. Photograph showing details of the circular testing track of the National Crushed Stone Association.

in the laboratory of the National Crushed Stone Association to investigate the efficiency of stone screenings as a blanket course under a macadam layer. This experiment was performed by means of the circular



Fig. 2. Clean, fine sand subgrade with 2 inches of screenings and 3 inches of 1½ to 2½ inch stone. This section was insufficient to prevent complete churning of surface with subgrade.

track testing apparatus, shown in Fig. 1. A detailed description of this apparatus appears in the May-June issue of *The Crushed Stone Journal*. Briefly, it consists of a circular concrete track 14 feet in mean diameter built in the form of a trough 18 inches wide and 6 inches deep. A cast iron roller 6 inches wide and weighing 200 pounds per inch of width is mounted at the end of a radial arm, driven by an electric motor through a speed reducer at the desired speed. The cast iron roller may be replaced with a rubber tired wheel when necessary.

In the present experiment two artificial subgrades were prepared, each covering half the circumference of the track. One was a fine plaster sand and the other was plastic clay obtained from a local brick yard. The clay was mixed with water to a consistency such that after compaction by means of a tamp it could be walked upon without greater indentation than about ¼ of an inch. The sand was likewise dampened and was of such a nature that it could not be compacted appreciably. The clay contained 17.1 per cent of moisture and the sand 7.5 per cent. On



Fig. 3. 1½ to 2½ inch stone laid directly on clay subgrade.

Note how the clay has penetrated the stone layer.

each of these two subgrades three sections were laid as shown in the following table:

Section No.	Subgrade	Blanket Course Stone Screenings	1½ .to 2½ inch Crushed Stone			
1	Clay	None	3 inches (loose)			
2	Clay	1 inch (loose)	3 inches (loose)			
3	Clay	2 inches (loose)	3 inches (loose)			
4	Plaster sand		3 inches (loose)			
5	Plaster sand	1 inch (loose)	3 inches (loose)			
6	Plaster sand		3 inches (loose)			

The following table shows the gradation of the screenings and of the  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inch stone.

Gra	dation of	reenings	Gradation of 1½ to 2½ inch Stone							
Total	Retained	on	No. 4-0	Total	Retained					
66	44		8-34			44	_	in.—59.0		
		66	16-60	44	44	44	11/2	in.—41.0		
64	66	66	30 - 75					-		
44	4.6	66	50-84					100.0		
4.6	.6	66	100-90							

The layers of screenings were placed loosely without any compaction and the stone layer was placed



Fig. 4. One inch of screenings laid on a clay subgrade. Note that the clay has not penetrated upward into the 1½-2½ inch stone layer.

either immediately upon the subgrade or upon the loosely compacted screenings to a loose thickness of 3 inches. The cast iron roller was then run at a speed of approximately 3 miles per hour in the same direction continuously around the track. The position of the roller was shifted laterally approximately 1 inch for each round trip. Approximately 60 passages of the roller were made over the track, during which time the roller was moved from the inside to the outside of the track and back again three times, making six complete lateral passages over each section. The effect of this action on the several sections is best seen in the accompanying photographs.

In Fig. 2 is shown a surface view of one of the sand subgrade sections, that containing 2 inches of screenings. The other two sand sections behaved in about the same manner as this one. The screenings layer was not effective in preventing the sand from working its way up into the stone. The reason for this is attributable to the fact that the sand was so exceedingly unstable that the roller forced it out laterally

and displaced it upward at the sides to such an extent that stone, sand and screenings became churned and mixed together. On the clay subgrade, however, the screenings were remarkably effective.



Fig. 5. Clay subgrade with 2 inches of screenings. No upward movement of the clay into the stone layer.

In Fig. 3 is shown a top view of the stone surface after completion of the test. It will be noted that the clay subgrade has penetrated upward completely through the stone. This did not occur in either of the sections of clay subgrade upon which a blanket layer of screenings was used.

In Fig. 4 is shown a cross-sectional view of the road surface having one inch of screenings on a clay subgrade. It will be noted that there is no upward penetration of the clay into the stone. The screenings have completely shut off this upward intrusion.

In Fig. 5 is shown a similar view of the section containing a clay subgrade with 2 inches of screenings interposed between the layer of stone and the subgrade. Again, the screenings have effectively shut off the clay from upward penetration into the stone.

In Fig. 6 is shown a cross-sectional view of the section in which the stone is laid directly on the clay subgrade. Note how the stone has been pushed almost completely through the three inch layer of clay and how the clay has penetrated upward through the voids in the stone. One might readily imagine how un-



Fig. 6. 1½-2½ inch stone laid directly on clay subgrade. Note how the stone has been pushed down into the clay which has penetrated through the stone layer.

stable this condition might be if the clay were to become saturated with water.

In conclusion, it would seem that when a macadam road is built on a clay subgrade it would be a wise precaution to use a blanket course of screenings before laying the coarse stone. A layer from one to two inches in thickness should be sufficient for this purpose. This layer will serve to prevent the upward intrusion of the clay into the stone and in this manner the inherent stability of the stone layer will be preserved. When the subgrade is composed of extremely finely divided clean sand, such as used in these tests, the screenings may not be efficacious when applied in a layer as thin as two inches.

## Local Communities Should Encourage Use of R. F. C. Funds

WITH hundreds of millions of dollars starting a march from federal vaults to labor's pockets via local construction projects, unemployment relief brought about by the new two billion dollar Federal Relief and Construction Act is well under way. Newest development in the program is the emphasis placed on the importance of getting local building work started immediately.

"That this program is intended primarily to spur local construction of needed improvements, with relief of local unemployment conditions, use of local materials and general benefit to local business is the important point that needs emphasis," said a prominent building association official recently. "It is necessary to overcome the erroneous idea that the vast sum now available for relief, work relief and local construction is intended primarily for federal use, or for the use of large corporations. Some of the money wil' be used for these purposes, but by far the greatest amount is intended for and will go to the individual community-to towns, cities, counties and states throughout the country-for immediate use for local relief and on local construction work as the local governmental bodies see fit."

Consideration of the actual figures makes this clear. There is available under the Relief Act a total of \$2,122,000,000. Of this some \$200,000,000 goes directly into federal works already authorized. Some additional funds will be loaned to states for federal-aid highway work and there will be loans for forest preservation, agricultural relief and marketing and certain other projects. But the major part of the two billion dollars remaining, many times the amount scheduled for any other activity, is to be devoted entirely to local construction and relief work, as planned, directed and worked out by local agencies.

Loan requests from every part of the country are now pouring into Washington. Almost every type of local improvement is being considered under one or another section of the Relief Act. Under section I of the Act, which provides \$300,000,000 for relief and work relief for local communities, many towns, cities and counties, as well as states, are applying for funds to be used for suitable local projects as well as for direct relief.

To provide work for the local unemployed, requests for funds for the construction of local public works, such as school buildings, fire stations, sewage systems, roads and streets, city buildings, lighting systems, pumping stations and similar projects are being received daily at the Reconstruction Finance Corporation headquarters in Washington.

Hundreds of loan applications for self-liquidating local projects are also coming in. These projects are provided for under section II of the Relief Act, for which by far the largest amount of money is appropriated-a total of one and one half billion dollars. Loans from this fund made to local agencies are for local construction projects which will, over a period of time, have an income (not from taxes) great enough to gradually pay back the loans. Atlanta, Georgia, for example, has applied for ten million dollars to construct a new sewage system with modern disposal facilities. The loan may be repaid by making a service charge to residents for use of the new system. In some communities, where the local government is not allowed to make such charges, non-profit corporations, as allowed in the Relief Act, are being formed by local citizens to make the loan and handle the project for the community until the loan has been repaid, when the project will be turned over to the local authorities. Loan applications for every conceivable type of project which will help local unemployment conditions and give communities needed public improvements are being handled as rapidly as possible. Typical projects being considered are public bridges, water-works, markets for public use, low-cost housing projects, slum area reconstruction, certain local highway projects, swimming pools, playgrounds, park systems and similar local improvements.

"It is interesting to see how certain communities have seized upon this opportunity for reviving local business, putting money into circulation, easing unemployment and getting local public works now, financed without difficulty, while other sections are wasting time or from sheer apathy are still ignorant of the chances for local improvements," said one observer in Washington today. "The short time limit provided by the Relief Act means that those communities which make first application will in all probability realize first benefits, while those who lag behind may get left out entirely. To get local projects lined up, to lay out plans and provide sites takes time. With a maximum of two years' time-much less for certain projects-it looks as though some localities will hardly be able to complete their loan plans and get consideration unless work is started immediately. It is up to the local authorities to realize that here is an unequaled oppor-

tunity to turn the tide toward local as well as national prosperity, and that speed is needed to realize upon it."

## One-Room Schools Become Fewer as Improved Highways Increase

THE little red schoolhouse continues its retreat before the motor age. Its rate of disappearance is definitely proportioned to the rate of increase in improved highway mileage. Every acceleration in road construction is marked by a corresponding decrease in the number of one-room schools.

These points are well borne out by a recent comparative analysis of school and highway data by the American Road Builders' Association. These statistics, dealing with five typical states, reveal strikingly the meaning of better transportation to improvement in educational facilities.

In North Carolina, the analysis shows, there were 2,989 one-room schools in 1924, and 1,714 miles of improved highway. By 1930 the first class highway mileage had increased to 4,025 while the number of single-room schools had declined to 1,400. The State presents one of the most emphatic evidences of the principle that the consolidation of rural schools is entirely a matter of efficient transportation.

Indiana, in the Middle-West, has made the same kind of progress, the association's comparison shows. In 1924 that State had 3,452 one-room schools and only 911 miles of first class highways. In 1930 the number of schools had dropped to 2,050 while good road mileage had increased to 3,137.

Precisely the same trend is shown in the other three States covered by the comparison. This trio includes Virginia, Alabama and South Carolina. The first-mentioned shows a gain of 850 miles in highways and a decline of approximately 450 one-room schools in the six-year period. In Alabama good roads increased from 128 to 775 miles while one-room schools decreased from 3,365 to approximately 2,900. South Carolina's road mileage climbed from 238 to 1,467 between 1924 and 1930 while the number of single-room schools dropped from 2,561 to 1,600.

Commenting on the analysis, T. H. Cutler, President of the American Road Builders' Association says:

"The States studied comparatively may be taken as typical of the situation which shows that school consolidations are continuing to be made at a rate definitely proportioned to the improvements in State highway systems. In the old days it was necessary to take the school to the child because it was impossible to take the child to the school. Now that condition is reversed and the little red schoolhouse definitely is on its way out of the social picture of the United States.

"The figures show that it is not necessary to divert motor vehicle taxes directly to education to make highway transport a profoundly favorable influence upon this function of our Governmental system."

## "More or Less" Contracts May Prove Costly

By LESLIE CHILDS

N THE furnishing of crushed rock and stone for construction jobs, it is not always possible to compute the exact yardage required in advance. This difficulty is then frequently handled by drawing a contract that calls for the furnishing of an estimated quantity followed by the words "more or less". The question then of how the courts construe provisions of this kind becomes one of great importance.

Of course, since each case of this kind must necessarily be decided in the light of its facts, the subject cannot be covered by any hard and fast rule. However, the courts are inclined to take a common sense view of such provisions, and where an estimated quantity in a "more or less" contract is tied with the job to be supplied, the buyer will usually be held obligated to receive the amount required for the job. The application of this rule of construction is illustrated in interesting manner in the following recently decided case.

#### Possibilities of Misinterpretation

In this case the defendant, a highway contractor, secured a contract for the construction of 7.3 miles of highway. Following this, he entered into a contract with the plaintiff for the crushed rock to be used on this job at the price of \$1.55 per cubic yard. In respect to the quantity to be furnished, the contract recited:

"It is hereby agreed \* \* \* that said party of the second part (plaintiff) shall furnish 15,000 cubic yards more or less, of 1-inch crushed rock for surfacing said highway, \* \* \* the exact quantity to be delivered shall be agreed upon between the parties hereto as the work progresses."

Pursuant to this contract, plaintiff delivered 9,590.9 cubic yards of rock which was accepted and used by the defendant. Defendant thereupon refused to accept any more rock from plaintiff, and obtained the amount required to finish the job from other sources. Plaintiff thereafter brought the instant action to recover the profit he would have made on the additional rock, had he been allowed to furnish it, and claimed the additional amount used by defendant was about 14,000 yards.

In defense, the defendant admitted the contract, and that he had refused to receive further rock from plaintiff after having received 9,950.9 cubic yards of rock; defendant further admitted that in making the improvement he used 20,258 cubic yards of crushed rock.

◆ Too much care cannot be given to the wording of contracts covering the purchase of material. The illustration set forth by Mr. Childs is a timely warning which if heeded may prevent serious

However, defendant took the position that the phrase in the contract, "the exact quantity to be delivered shall be agreed upon between the parties hereto, as the work progresses", governed.

From this it was argued that defendant had the right to refuse to accept any crushed rock from plaintiff at such times as he saw fit. In other words, that, under the contract, defendant was not obligated to accept any crused rock from plaintiff unless he desired so to do, and that he had the right to refuse to accept rock at any time. This then squarely raised the question of what quantity of rock was called for by the contract when all its terms were read together. The trial court found for the defendant on this point. Plaintiff appealed and the higher court in construing this contract reasoned as follows:

#### The Language of the Court

"In the very beginning of the contract it is recited that (the defendant) has a contract \* \* \* 'for the construction of 7.3 miles of highway' \* \* \* 'and is desirous of contracting with the said (plaintiff) for crushed rock for surfacing said highway'. There can be no question as to what highway is referred to here; it is 7.3 miles of highway between two certain designated points. \* \* \*

"It is evident that the 15,000 cubic yards, more or less, is only an estimate, not the exact quantity that would be required, not the exact quantity the plaintiff covenanted to deliver, and not the exact quantity which the defendant agreed to purchase. That quantity was to be determined from time to time as the crushed rock was delivered; it could not be agreed upon otherwise, unless the parties knew exactly the number of cubic yards required to surface the said highway, which was set forth as being 7.3 miles. \* \* \*

"The answer of the defendant admits refusal to accept more than 9,590.9 cubic yards of crushed rock; it admits the use of 20,258 cubic yards in the construction of the highway mentioned in the contract. From what we have stated, the contract and the admissions of the pleadings in this case demonstrate that the plaintiff was entitled to judgment on the first count set forth in his complaint". (5 Pac. 2d. 886)

#### Conclusion

So that was that, and as an illustration of judicial reasoning on the construction of a "more or less" contract the above case is instructive. Here, as we have seen, the quantity named in the contract, as 15,000 cubic yards more or less, was intimately tied to the stretch of highway to be constructed, and the court in ruling on what was meant read the contract as a whole, which in effect obligated the defendant to take his requirements for that improvement.

The holding announced is in accord with the weight of authority on the question involved, and yet owing to the wording of the contract the dispute which arose was only settled at the expense of a long drawn out lawsuit. In the light of which, it would seem but prudent to have contracts of this character specifically specify the rule of measurement, as the buyers requirements or needs for a named work, rather than leave the meaning to be gained from the general terms thereof. This in no way weakens the force of a named estimate, more or less, and will usually cut off all reason for after dispute in respect to the rule of mea-

## O. P. Chamberlain Leaves Dolese and Shepard Company

surement to be applied.

COL. O. P. CHAMBERLAIN, for many years actively identified with the Dolese and Shepard Co. of Chicago, Illinois,, recently announced his resignation as President of that concern. As through this action he is no longer actively engaged in the production of crushed stone, the Colonel has also tendered his resignation as a member of the Board of Directors of the National Crushed Stone Association. A pioneer in the crushed stone industry and always a loyal and enthusiastic supporter of National Association activities, his helpful counsel and advice as a member of our Board of Directors will be sorely missed.

Col. Chamberlain has established an office at 111 W. Washington St., Chicago, and will act as a consulting engineer and manufacturers' agent. He will handle a few selected lines of machinery and equipment with which his experience as a quarry operator have made him familiar. It is our sincere wish and confident expectation that success will attend him in this new undertaking.

#### Highway Research Board Will Meet

THE Highway Research Board will hold its Twelfth Annual Meeting on December 1 and 2 at the Building of the National Academy of Sciences and National Research Council, Washington, D. C. Included on the program are many topics which should be of special interest to crushed stone producers and it is hoped a representative number will find it possible to attend this interesting meeting.

#### More Highways Justified

THE slight hesitation in the spread of automobile ownership during the last two years should not be taken as a sign that the saturation point of either automobiles or roads is here.

Automotive and highway authorities almost without exception are of the opinion that within the next ten years the present registration of 26,000,000 cars will be swelled by several millions. Despite the drop in car sales in 1931 more miles were traveled than ever before.

That road building must go on at full speed is the message written in present highway usage and needs, in existing records of road maintenance which show that too much is being spent to keep poor roads travelable, in automobile accidents which continue to increase.

The United States will have by this fall 100,000 miles of concrete pavement which is held to be at least 100,000 miles shy of the mileage needed from the standpoint of economy in road upkeep and in car operation.

Three-fourths of the nation's travel over rural roads is carried on the state highway systems which total 324,500 miles. Of this, 225,000 miles have been surfaced but even many of these surfaces are of an inferior, uneconomical nature. Many cost from \$150 to \$900 more per mile per year to maintain than high type pavement. The Federal Aid system of nearly 200,000 miles, largely coincidental with the state systems, and carrying half of all rural traffic, is still far from complete.

It is impossible to grasp the magnitude of motor usage. Pleasure-bent motorists will this year spend some three billion dollars in traveling no one knows how far or where. Twenty million head of livestock will ride to market in motor trucks. The bus travel in this one country will be in the neighborhood of two billion passengers, almost as many people as there are on earth.

Any sort of a moratorium in highway construction would be ill-timed and in violation of economic laws which possibly can be frustrated but at great cost.

The automotive and road building industries are the country's greatest employers of men.

Diversion of road funds, contributed by motorists for roads, to purposes unrelated to highways, and curtailment of road construction, are considered by the nation's industrial and business leaders to be the greatest deterrents to the return of those much-sought-for good times.

So aside from the social and economic needs for rapid road construction there is the all important matter of jobs. Unhampered, the construction of roads and streets and traffic safety facilities can be of more pronounced leadership in rejobulating the jobless.

## Methods of Reclaiming Old Macadam Roads

By H. P. CHAPMAN

Asst. Director and Chief Engineer, Ohio Department of Highways, Columbus

THE PROBLEM of widening and resurfacing is one which is becoming increasingly important each year in our highway programs.

All of the states where a program of highway building was embarked upon over ten years ago are now facing a situation where the main roads are inadequate for present traffic needs. Our traffic surveys show a steady increase year by year and no one can accurately predict where this will end.

Even up to 1925 a sixteen-foot pavement was considered adequate for a two-lane traffic and grades and curves were in some cases permitted which could not be tolerated today. A twenty-foot pavement is now used for a two-lane road and, if widths of vehicles are held within present bounds, this should be adequate for a long time to come.

We have in Ohio several thousand miles of pavement sixteen feet or less in width, the strength of which is adequate but which is too narrow and in some cases too rough to satisfy motorists who are becoming educated to the wider and smoother roads.

The method to be employed in accomplishing this constitutes one of our major engineering problems. The following are some of the questions which must be answered:

- 1. Do the line and grade conform nearly enough to present standards to make widening and resurfacing advisable?
- 2. Is the surface of the present pavement smooth enough that it can be resurfaced without excessive cost?
- 3. Is the present pavement strong enough for a base?
- 4. What is the density and character of traffic?

These questions must all be answered by a careful study in the field before any engineer can determine what type of resurfacing to use or whether to attempt resurfacing at all.

We have almost four hundred miles of narrow pavement, mostly bituminous macadam, on our 1932 construction program in Ohio and surveys are now being The increasing intensity of traffic on narrow width roads constructed many years ago presents a real problem to state highway departments. Mr. Chapman offers some valuable suggestions as to how to make serviceable under present day conditions the large mileage of old macadam roads.

made in order to answer the above questions for each individual project. It will, undoubtedly, be found in a small per cent of cases that resurfacing of any type would be uneconomical and that new construction should be substituted, but for almost all of this mileage some sort of widening and resurfacing will be designed.

Two types of base course are used: Water Bound Macadam and Concrete. A black base has been proposed but so far none of it has been used, although I believe it has possibilities if it can be brought within the price range of the other materials.

The width of base used in widening an old macadam road would theoretically be four feet, two feet on each side but in practice it will vary from two to three feet on each side. It has been found that it is very difficult to roll this narrow water bound widening unless an excessively thick course is used and if the thick course is used proper filling of the voids may not be obtained. Both the compaction and the filling are essential to a good base so it has been necessary to adopt methods to overcome these obstacles. One has been to spread one to two inches of screenings in the bottom of the trench before placing the coarse stone. This forms a mat over the subgrade and fills the lower voids of the course from below as it is rolled. Another solution is to use what is known as a ready mixed macadam which can be obtained from some of the stone producers. This is a mixture of coarse stone and screenings shipped and applied damp enough to prevent segregation. Another method which I have thought of would be to mix the stone and screenings at the unloading point and haul the mixture out wet. This would do away with hauling and applying water and piling screenings along the berms, both of which operations are more or less costly and unsatisfactory. I have never heard of this method being used and practical difficulties might be encountered which would make it inadvisable, but I am sure that it would give satisfactory results.

It is almost impossible to feather out the water bound base over low spots in the old metal to a depth of less than about two inches and for this reason a penetra-

<sup>&</sup>lt;sup>1</sup> Presented at the Fifteenth Annual Convention of the N. C. S. A., Pittsburgh, Pa., January 19-22, 1932.

tion patch has sometimes been placed using just enough bituminous material to hold it. It is of prime importance to correct any excessive irregularities in the old pavement before placing top material.

Concrete widening is employed in some cases where a higher type of bituminous surface is to be placed and the use of a mechanical finishing machine required for the entire top course. We have used both the flush and the submerged widening. I personally favor the submerged type with a nine inch flush curb. The inside should be placed directly against the old metal and the flush surface, which is to support the finishing machine, should have a smoothness of one-eighth inch in ten feet.

Almost all of our old sixteen foot pavements have an excessive crown. They were constructed with about three inches of crown and edge settlement has made this more pronounced. This condition makes it necessary to place a wedge or building up course, which can be done by extending the base in some cases, by bituminous penetration patches as previously mentioned, by mixed-in-place or retread or by any other method which will remedy the irregularities and insure a top of uniform thickness. Here I wish to emphasize again the importance of building up the base in such a way that the surface course will be uniform, for no bituminous surface course has yet been found which can be laid two inches thick in one place and four inches a few feet away and give satisfactory results. The compaction will be twice as much in the four inch spot and a rough riding job will be the result.

Four principal types or classes of bituminous surfaces are now in use, namely, mixed-in-place or retread, bituminous macadam, cold laid plant mixed and hot laid plant mixed.

Bituminous macadam is probably the oldest type and it needs no description here. Where conditions are such that it can be used it gives very good results and it is undoubtedly as durable as any of the others. The fact, however, that small variations in thickness will produce fat and lean places and the difficulty encountered in keying the stone over smooth rigid surfaces are responsible for the fact that it has given way largely to the other types so far as resurfacing is concerned.

Mixed-in-place macadam or retread has been in use for several years and is adaptable to almost any condition. It consists of placing the aggregate on the road in windrows, then applying the bituminous material and blading the aggregate back and forth until it is thoroughly coated. Care must be taken to avoid getting dirty or coated aggregate as the dust absorbs the bituminous material and does not leave sufficient to act as a binder. Some of the smoothest pavements we have are built in this manner. When used in connection with widening it is placed over a water bound

base and it has been used extensively for surfacing well-compacted traffic bound roads.

Several mechanical methods for mixing aggregate and asphalt emulsion have come into use during the past year but I am not familiar enough with them to discuss them thoroughly.

The cold laid bituminous mixtures are produced by commercial plants under various trade names. I do not care to enter into a discussion of the merits of the various brands but as a class they have proved very satisfactory. The refinements of manufacture made possible by a permanent plant should and do give a very uniform and durable product. During the construction season they can be laid with a mechanical finishing machine and an excellent surface obtained. These materials vary somewhat in the volatility of the solvent used, if any, and the rolling must be done at the proper time. This time can only be determined by trial unless the manufacturer is able to furnish the information.

The last type of surface which I wish to mention is the hot laid which is mixed in an ordinary sheet asphalt plant. The modification which has been developed in Ohio during the past year consists of a graded aggregate with from six to nine per cent of bitumen. The grading is so controlled as to permit a certain per cent of voids. This gives a dense product with a granular top which is very desirable in order to avoid slipperiness. It has been used to resurface all types of pavements and so far has given satisfactory results.

I have outlined only those types which I believe would be of most interest to your organization and I wish to say that the problem of resurfacing and widening is the most important now facing any one interested in highway building. Methods followed when entirely new roads were being built must be revised or abandoned as the case may be and others adopted which fit into the present scheme. You will find the engineers ready and willing to accept suggestions which will aid in solving our problems and we will expect your cooperation in getting the most for the money we have to spend.

#### Birdsboro Steel Foundry and Machine Company Acquires Buchanan Interests

The full ownership and direct management of the C. G. Buchanan Co., Inc., 90 West St., New York City, have been acquired by the Birdsboro Steel Foundry and Machine Co. of Birdsboro, Pa. All interests, patterns, drawings and good will have been acquired and manufacturing will be done at Birdsboro. The New York office will be located at 90 West St., and will be under the management of Mr. George H. Keppel.

#### « « EDITORIAL

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THE Sixteenth Annual Convention of the National Crushed Stone Association will be held at the Book-Cadillac Hotel, Detroit, Michigan, January 16, 17 and 18, 1933. At no time in the experience of our industry has it seemed so necessary for crushed stone producers to get together to weigh carefully and evaluate properly the highly significant developments of the past year and by making use of our combined intelligence, plan constructively for the future.

Since our last annual meeting held in Pittsburgh during January of this year, a heartless struggle for economic survival has been waged on every industrial front in this country, the intensity of which has been increasing month by month. The cost to industrial America of this ruthless economic war staggers the imagination, and it is certainly not in the nature of a prophecy, but the statement of a simple fact, to say that our industrial structure will not long survive such a strain.

During the present year conditions in the crushed stone industry have become acute-much that has been accomplished during years of painstaking effort has been temporarily set aside under the predatory urge to survive at all costs. Fear has undermined our judgment; suspicion has been substituted for confidence; we have become the victims of individualism, forgetting the lessons learned through years of experience which have so clearly demonstrated that the individual prospers only in proportion to the wellbeing of the industry of which he is a part. It seems high time that we raise our sights above the level of our own individual difficulties, no matter how acute they may be, and seek every possible means to rehabilitate the industry from which we obtain our livelihood. No more effective instrumentality has been devised for assisting in the accomplishment of this objective than our annual convention.

Struggling day by day to make ends meet, it is only natural that our point of view be very largely restricted to our own horizon, and that we fail to see the subtle and oft-times far-reaching changes which are taking place around us. And even when recognized, we are inclined to analyze such changes on the basis of their immediate and individual effect. Sound judgment, under such circumstances, is seldom possible. It takes the broadening influence of the experiences of others engaged in the same occupation to give us the proper perspective to really comprehend the problem. Moreover, the outside viewpoint is often-times most helpful and not infrequently absolutely essential if we are to do that which is designed to benefit us most in the long run.

Present conditions have brought forth many new problems, to say nothing of emphasizing old ones. Roadside competition has assumed alarming proportions and this situation demands immediate attention. The best minds of the industry will be available at Detroit to consider this development and many others too numerous to mention. Present conditions offer us a challenge which cannot be over-looked; it must and will be met at our Sixteenth Annual Convention in Detroit next January.

The success of the annual meeting is largely dependent upon the location of the convention city and the environment and facilities offered by the headquarters hotel. From the point of view of both of these considerations, no one will dispute the wisdom of the Board of Directors in selecting the Book-Cadillac Hotel in Detroit. As regards location, by far the majority of our members will be able to reach Detroit with but little more than an over-night ride. This, coupled with the fact that the railroads have authorized an extraordinary reduction in fares for the convention (fare and one-ninth for the round trip as compared to fare and one-half for previous years), should be a decided factor in stimulating a large attendance. Those present at our 1927 convention, also held at the Book-Cadillac, will recall the exceptional convention facilities offered by that hotel. An especial advantage is the location of the exposition hall on the same floor with the other main convention activities.

Excellent room accommodations are available and substantial reductions have been made in the prices for meals, details regarding which are given on the advance hotel reservation blank which has just been mailed from the Washington office.

In stressing the advantages of convention attendance for our Sixteenth Annual Meeting, we should by no means overlook the Highway and Building Congress which will be held on Thursday and Friday, January 19 and 20, immediately following our meeting. The sessions of the Congress will be held at the Book-Cadillac Hotel which will make attendance especially convenient for delegates to our convention. Thursday, the first day of the Congress, will be devoted to highway contruction and Friday to building construction. For the first time in its history, our construction industry will exert a united and concerted effort to stimulate construction, not indiscriminately and unjustifiably but along sound economical, defendable lines, which should profoundly benefit not only the industry, but also the public which it serves. The enthusiastic response accorded the Congress movement



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has been more than gratifying, over twenty organizations now having indicated their intention of participating. A general committee on arrangements has been appointed with Mr. Charles M. Upham, Engineer-Director, American Road Builders' Association, Various sub-committees have been as Chairman. designated to take care of details. The program for the two Congress days is rapidly taking shape.

In short, the construction industry will be on parade in Detroit during the week of January 16 and every individual interested directly or indirectly in this basic industry must be keenly aware of the exceptional advantages of participating in this highly significant meeting.

Obviously, with more than twenty organizations meeting in Detroit concurrently, four of which will have headquarters at the Book-Cadillac Hotel, all desirable hotel accommodations will certainly be in demand. Through special arrangements with the Book-Cadillac, those organizations having headquarters there will be given preference in room reservations up to January 2, after which rooms still unreserved will be available to any convention delegate, regardless of association affiliation. It is anticipated that delegates to the annual conventions of the National Crushed Stone Association, the National Paving Brick Association, the National Ready Mixed Concrete Association and the National Sand and Gravel Association, all of which will have headquarters at the Book-Cadillac, will require substantially all of the desirable rooms available. Reservations will be made in the order in which they are received, and it is therefore highly important, if you wish to be certain of obtaining just the type of accommodations desired, that you make your reservations immediately.

Determine now to attend our Sixteenth Annual Convention and to remain over for Thursday and Friday for the Highway and Building Congress. The surest guarantee of reservations in the headquarters hotel is to immediately return the hotel room reservation blank which has been mailed you.

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## Quarry Section—National Safety Council Holds Interesting Session

THE Quarry Section of the National Safety Council held its annual meeting during the Twenty-first Annual Safety Congress which took place in Washington, D. C., during the week of October 3. The meetings of the Quarry Section, held during the morning and afternoon of October 6, were well attended and proved of unusual interest.

In the absence of General Chairman John Prince of Kansas City, Missouri, and of Wm. M. Andrews, Vice-Chairman, of Youngstown, Ohio, V. P. Ahearn, Secretary and Editor of the News-Letter presided and in a manner worthy of the warmest praise.

As the first speaker at the morning session, Wesley M. Graff, Director, Safety Engineering Division, National Bureau of Casualty and Surety Underwriters, New York City, presented a distinctly worth while paper entitled "The Determination and Control of Compensation Insurance Rates." In view of the widespread interest in holding to a practical minimum every item of expense which enters into the cost of production, Mr. Graff pointed out the desirability of analyzing the various factors which determine the cost of workmen's compensation insurance. His paper was devoted to a development of this theme, which he handled in an interesting and instructive manner.

S. M. Shallcross of the American Lime and Stone Co., Bellefonte, Pa., contributed a helpful discussion of Mr. Graff's paper, on the basis of studies he had made of the Pennsylvania Manual and the methods used by the Pennsylvania Rating Bureau in determining rates.

The second paper on the morning program was entitled, "Recent Progress of Safety in the Quarry Industry" and was presented by W. W. Adams, Chief Statistician, Demographical Division, U.S. Bureau of Mines, and Chairman of the Statistics Committee of the Quarry Section. Mr. Adams has the happy faculty of presenting statistical information in an effective and interesting manner. He laid particular emphasis on the progress made in the quarrying industry during the last several years, giving convincing proof of this general statement through a statistical comparison covering the nine-year period from 1922 to 1930. Mr. Adams pointed out that the quarrying industry as a whole has greatly reduced its accident frequency rate during the nine years ended 1930. He stated that as compared to nine years ago, the combined rate for all classes of operations has been reduced 35 per cent, being 10 per cent for quarry work proper and 56 per cent for outside work such as rock dressing or rock crushing and the manufacture of cement or lime. The

greatest progress has been made at marble quarries and quarries whose output was used in the making of cement. Illinois and New York, said Mr. Adams, have led all other large states in the amount of improvement made over their own previous records, while crushed stone quarries have outdistanced dimension stone quarries during the past nine years, and for seven years have had accident rates which were actually lower than those of dimension stone quarries which formerly led in safety.

The report of the Nominating Committee was next presented by its Chairman, A. L. Worthen, The Connecticut Quarries Co., Inc., New Haven, Conn., and resulted in the unanimous election of the following:

General Chairman Otho M. Graves, General Crushed Stone Co., Easton, Pa. Vice-Chairman

S. M. Shallcross, American Lime and Stone Co., Bellefonte, Pa.

Secretary and News-Letter Editor
Ralph Dinsmore, The Warner Co., Philadelphia, Pa.
Poster Committee Chairman

H. F. Yotter, General Crushed Stone Co., Easton, Pa. Publicity Committee Chairman

J. R. Boyd, National Crushed Stone Association, Washington, D. C.

W. W. Adams, U. S. Bureau of Mines, Washington, D. C. Members at Large of the Executive Committee Ahearn, National Sand & Gravel Association,

V. P. Ahearn, National Sand & Gravel Association,
Washington, D. C.
Wm. H. Baker, J. E. Baker Co., York, Pa.
R. E. Colville, United States Gypsum Co., Chicago, Ill.
Norman G. Hough, National Lime Association,
Washington, D. C.
A. L. Worthen, The Connecticut Quarries Co., Inc., New Haven,

Conn.

The Quarry Section is certainly most fortunate in having prevailed upon Otho M. Graves, President of the General Crushed Stone Co. of Easton, Pa., to accept the general chairmanship for the ensuing year. Mr. Graves has long been actively identified with the safety movement, his own company having accomplished amazing results in this field over recent years. Under his inspiring and enthusiastic leadership, the Quarry Section is destined to make a new mark in promoting accident prevention throughout the quarrying industry. S. M. Shallcross, American Lime and Stone Co., Bellefonte, Pa., brings to the office of Vice-Chairman a background of experience and accomplishment in safety work which should prove particularly helpful in carrying the Quarry Section through a successful year.

Following the election of officers, H. B. Immel, formerly Director of Bureau of Inspection, Pennsylvania Department of Labor and Industry-recently transferred to the position of Safety Executive, Pennsylvania Department of Highways, made a very noteworthy contribution to the meeting in his paper, "The Economic Necessity for Community Safety Work and Its Relation to the Quarrying Industry." Mr. Immel made a convincing appeal for the establishment of community safety councils as the best of all agencies for imparting safety consciousness to the community as a whole. In leading the discussion on Mr. Immel's paper Mr. Shallcross said "it contained a promise, a threat and an opportunity—a promise that taxes can be reduced if business will get back of safety programs; a threat that unless the public takes up the safety program seriously the state must protect the public against itself by a program involving expansion of state organizations and passing of many forms of social legislature; and an opportunity to immediately reduce accidents materially, because in organizing a county or community safety council favorable public opinion is or can be had at the inception of the movement." Mr. Shallcross was strongly in favor of the establishment of county or community safety councils as contrasted to the building up of state organizations.

In concluding the morning session, the Chairmanelect, Mr. Graves, was called upon. After gratefully acknowledging the honor which had been bestowed upon him, he expressed the conviction that for some time the Quarry Section has not been doing the work which it could rightly do. He stated that the newly elected officers would set before the Executive Committee a crystallized program for the Section

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which he hoped would be serious, real and definite in its purpose and susceptible of real achievement.

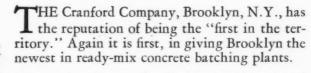
The first feature of the afternoon program was divided into two sections under the general subject, "The 1931 Safety Contest and What We Achieved Through Participation." Mr. M. V. Miller, Vice-Chairman, Berkeley Plant Safety Committee, North American Cement Corporation, Martinsburg, W. Va., was the first speaker, his company having won the National Crushed Stone Association Safety Contest for 1931. Mr. Miller expressed the opinion that unsuccessful safety campaigns fail largely for the following reasons: 1. Lack of cooperation between foremen and employees; 2. Safety campaigns organized with enthusiasm which gradually dies out until the idea is forgotten; 3. Creation of records of local interest only and not national. Mr. Miller concluded by saying, "Too much credit can not be given to the various associations, such as the Portland Cement Association and the National Crushed Stone Association and to the U.S. Bureau of Mines for offering trophies and assisting in the conduct of safety campaigns. Sincere safety workers appreciate a 'boost' just the same as receiving a reprimand. When a plant has won a trophy of national recognition, the employees will feel their efforts have not been in vain and that they are assisting in promoting the general welfare of their fellow employees and their families."

Ralph Dinsmore, Personnel Manager, The Warner Co., then discussed the subject, as the winner of the National Sand and Gravel Association Safety Contest. Mr. Dinsmore laid emphasis on the steps necessary to effectively undertake accident prevention work. First, he considered it essential to obtain accident data and to tabulate it so that it could be determined where accidents were happening; second, was the organization of safety committees at the various plants. He pointed out the advantages of having a monthly foremen's bulletin in which is given full detail with regard to accidents which may occur. This bulletin is sent not only to the foremen, but also to the executives and superintendents so that each division head knows exactly which foreman is having accidents and what they are costing. Mr. Dinsmore stated that his company now requires all new workers to undergo a physical examination. At the time this practice was established the request was made to old workers to be examined and it is interesting to note that out of some 1,500 employees, very few objected to the physical examination.

Mr. Dinsmore's paper was exceptionally well prepared and gives in detail the various elements which have made for successful accident prevention in his organization.

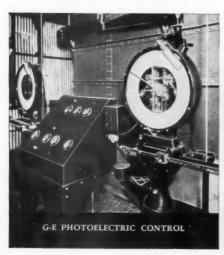
The afternoon session concluded with an illustrated lecture entitled, "Visualizing the Mineral and Allied Industries," presented by M. F. Leopold, Safety Engineer, U. S. Bureau of Mines, Washington, D. C.

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This Congress will bring about the first real mobilization of members of related organizations of the construction industry. Its large scope and breadth is indicated by the importance attached to it by more than 20 organizations that will participate with annual meetings and conventions.

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DETROIT, MICH. JANUARY 16-18, 1933

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